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EXAMINER	
HO, ALLEN C	

ART UNIT	PAPER NUMBER
2882	

DATE MAILED: 08/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/717,051	BIJJANI ET AL.
	Examiner	Art Unit
	Allen C. Ho	2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 July 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 3-36* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *8,9,25 and 28-36* is/are allowed.

6)☒ Claim(s) *1,3-7,10-24,26 and 27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *24 March 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claims 16 and 17 are objected to because of the following informalities: Claims 16 and 17 recite the limitation "conducting scans". There is insufficient antecedent basis for this limitation in the claim. Appropriate correction is required.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1, 6, 7, 10-15, 18-20, 21, 22, and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by Krug *et al.* (U. S. Patent No. 5,838,758).

With respect to claims 1 and 24, Krug *et al.* disclosed a method for analyzing an object comprising: pre-scanning the object using a multiple energy x-ray device (**100**) to determine information (positional information) indicative of effective atomic number characteristics (column 1, lines 41-52) of the object; and transmitting the information to a processor coupled to a computed tomography device (a CT must have a processor that performs image reconstruction), wherein at least a portion of the multiple energy x-ray device is not common to the computed tomography device (either as separate units or a single unit).

With respect to claim 6, Krug *et al.* disclosed the method of claim 1, further comprising using the information to determine density characteristics of the object (since the linear absorption coefficient is proportional to the density).

With respect to claim 7, Krug *et al.* disclosed the method of claim 1, further comprising using the information to determine a plane (slice) of the object to be scanned (column 32, lines 32-35).

With regard to claim 15, Krug *et al.* disclosed the method of claim 1, wherein the computed tomography device comprising a portion of a unit that also comprises the multiple energy x-ray device (either as separate units or a single unit).

With regard to claim 21, Krug *et al.* disclosed the method of claim 1, wherein at least an x-ray source of the computed tomography device is not common to the multiple energy x-ray device (column 32, lines 18-37).

With regard to claim 22, Krug *et al.* disclosed the method of claim 1, wherein at least an x-ray detector of the computed tomography device is not common to the multiple energy x-ray device (column 32, lines 18-37).

With regard to claim 10, Krug *et al.* disclosed an apparatus for analyzing an object comprising: a multiple energy prescanner (**100**) that prescans the object; and a computed tomography device (**1002**) that scans one or more areas of interest of the object based on information (positional information) indicative of effective atomic number characteristics (column 1, lines 41-52) of the object transmitted from the multiple energy prescanner, wherein at least a portion of the multiple energy prescanner is not common to the computed tomography device (column 32, lines 18-37).

With respect to claim 11, Krug *et al.* disclosed the apparatus of claim 10, wherein the multiple-energy prescanner has a high-energy x-ray source and a low-energy x-ray source (dual energy).

With respect to claim 12, Krug *et al.* disclosed the apparatus of claim 10, further comprising a conveyor (**5**) for transporting the object from the multiple-energy prescanner to the computed tomography device.

With respect to claim 13, Krug *et al.* disclosed the apparatus of claim 10, wherein the computed tomography device is a multiple-energy computed tomography device (column 32, lines 38-40).

With regard to claim 18, Krug *et al.* disclosed the apparatus of claim 10, wherein the multiple energy prescanner and the computed tomography device are implemented as a single unit (column 32, lines 38-40).

With regard to claim 19, Krug *et al.* disclosed the apparatus of claim 10, wherein the information indicative of effective atomic number characteristics of the object is updated based on second information generated by the computed tomography device (when the actual location of the suspicious object is determined by the computed tomography device).

With regard to claim 20, Krug *et al.* disclosed the apparatus of claim 19, wherein the second information is indicative of density characteristics of the object (the x-ray attenuation measured by the computed tomography device is indicative of density characteristics of the object).

With regard to claim 14, Krug *et al.* disclosed an apparatus for analyzing an object comprising: an multiple energy prescanner (**100**); and a computed tomography device (**1002**),

wherein at least a portion of the multiple energy prescanner is not common to the computed tomography device; wherein information indicative of at least one metal artifact is transmitted from the multiple energy prescanner to a processor coupled to the computed tomography device (when the positional information transmitted is the position of a metallic object).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 3 and 4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krug *et al.* (U. S. Patent No. 5,838,758) as applied to claim 1 above, and further in view of Tuy (U. S. Patent No. 5,243,664).

With respect to claim 3, Krug *et al.* disclosed the method of claim 2. However, Krug *et al.* failed to teach performing a metal artifact correction based on the information.

Tuy disclosed a method of correction for metal artifacts. Tuy taught that a CT image, which includes metallic objects, would have severe artifacts (column 1, lines 18-30).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to performing a metal artifact correction based on the information, since a person would be motivated to obtain a CT reconstructed image that is free of metal artifacts.

With respect to claim 4, Krug *et al.* in combination with Tuy disclosed the method of claim 3, wherein performing a metal artifact correction includes performing a beam hardening correction (Tuy, column 2, lines 42-52).

6. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Krug *et al.* (U. S. Patent No. 5,838,758) and Tuy (U. S. Patent No. 5,243,664) as applied to claim 3 above, and further in view of Timmer (U. S. Patent No. 5,905,809).

With respect to claim 5, Krug *et al.* in combination with Tuy disclosed the method of claim 3. However, Krug *et al.* and Tuy failed to teach performing a scatter correction.

Timmer disclosed a method for correcting scattered x-rays for computed tomography. Timmer taught that scattered x-rays cause image artifacts (column 1, lines 43-44).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to perform a scatter correction, since a person would be motivated to obtain a CT reconstructed image that is free of artifacts.

7. Claims 16 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Krug *et al.* (U. S. Patent No. 5,838,758) as applied to claim 1 above.

With regard to claims 16 and 17, Krug *et al.* disclosed the method of claim 1, wherein conducting scans comprises conducting scans of areas of interest of the object with the computed tomography device based upon the information to determine second information indicative of density characteristics of the object (since the linear absorption coefficient is proportional to the density); and transmitting the second information to a processor (a computed tomography device would necessarily have a processor).

However, Krug *et al.* failed to teach transmitting the second information to a processor to determine whether to modify the information indicative of effective atomic number characteristics of the object.

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to modify the information indicative of effective atomic number characteristics of the object based on density characteristics of the object, since a person would be motivated to precisely identify the object based on both effective atomic number characteristics and density characteristics of the object as the combined information further narrows down the range of possibilities.

8. Claims 1, 6, 7, 15, 10-13, 18-24, 26, and 27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Peschmann (U. S. Patent No. 5,367,553) in view of Krug *et al.* (U. S. Patent No. 5,838,758).

With respect to claims 1 and 24, Peschmann disclosed a method for analyzing an object comprising: pre-scanning the object using an x-ray device (**32**) to determine information (location) of the object (column 7, line 17 - column 8, line 2); and transmitting the information to a processor (**26**) coupled to a computed tomography device (**44A**, **46A**, **50A**), wherein at least a portion of the x-ray device is not common to the computed tomography device.

However, although Peschmann disclosed the advantage of dual-energy scan (column 10, lines 48-68), Peschmann failed to disclose that the prescanner is a multiple energy x-ray device.

Krug *et al.* disclosed a multiple energy x-ray prescanner (**1000**) that transmits information (positional information) indicative of effective atomic number characteristics of the object to a computed tomography device (**1002**).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to employ a multiple energy x-ray prescanner. As is well known, a multiple energy x-ray prescanner obtains effective atomic number characteristics of an object, which further limits the possible materials being analyzed, thereby increasing the accuracy of material identification.

With respect to claim 6, Peschmann in combination with Krug *et al.* disclosed the method of claim 1, further comprising using the information to determine density characteristics of the object (Peschmann column 8, lines 1-2).

With regard to claim 7, Peschmann in combination with Krug *et al.* disclosed the method of claim 1, further comprising using the information to determine a plane (CT slice) of the object to be scanned.

With regard to claim 15, Peschmann in combination with Krug *et al.* disclosed the method of claim 1, wherein transmitting the information comprises transmitting the information to a processor (Peschmann **26**) coupled to a computed tomography device (Peschmann **44A**, **46A**, **50A**) wherein the computed tomography device comprising a portion of a unit (Peschmann **10**) that also comprises the multiple energy x-ray device.

With regard to claims 21 and 22, Peschmann in combination with Krug *et al.* disclosed the method of claim 1, wherein transmitting comprises transmitting the information to a processor (Peschmann **26**) coupled to a computed tomography device (Peschmann **44A**, **46A**, **50A**), wherein at least an x-ray source (Peschmann **46A**) and at least an x-ray detector (Peschmann **50A**) is not common to the multiple energy x-ray device.

With regard to claim 23, Peschmann in combination with Krug *et al.* disclosed the method of claim 1, wherein prescanning comprises prescanning the object using a second computed tomography device (Peschmann **44**, **46**, **50**).

With regard to claims 10 and 11, Peschmann disclosed an apparatus for analyzing an object comprising: an x-ray prescanner (**32**) that prescans the object; and a computed tomography device (**44A**, **46A**, **50A**) that scans one or more areas of interest of the object based on information (location) of the object transmitted from the prescanner (column 7, lines 17 - column 8, line 2), wherein at least a portion of the prescanner is not common to the computed tomography device.

However, although Peschmann disclosed the advantage of dual-energy scan (column 10, lines 48-68), Peschmann failed to disclose that the prescanner is a multiple energy x-ray device.

Krug *et al.* disclosed a multiple energy x-ray prescanner (**1000**) that transmits information (positional information) indicative of effective atomic number characteristics of the object to a computed tomography device (**1002**).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to employ a multiple energy x-ray prescanner. As is well known, a multiple energy x-ray prescanner obtains effective atomic number characteristics of an object, which further limits the possible materials being analyzed, thereby increasing the accuracy of material identification.

With regard to claim 12, Peschmann in combination with Krug *et al.* disclosed the apparatus of claim 10, further comprising a conveyor (Peschmann **20**).

With regard to claim 13, Peschmann in combination with Krug *et al.* disclosed the apparatus of claim 10, wherein the computed tomography device is a multiple energy computed tomography device (Peschmann column 10, lines 48-68).

With regard to claim 18, Peschmann in combination with Krug *et al.* disclosed the apparatus of claim 10, wherein the multiple energy prescanner and the computed tomography device are implemented as a single unit (**10**).

With regard to claim 19, Peschmann in combination with Krug *et al.* disclosed the apparatus of claim 10, wherein the information (location) indicative of effective atomic number characteristics of the object is updated based on second information generated by the computed tomography device (when the actual location of the suspicious object is determined by the computed tomography device).

With regard to claim 20, Peschmann in combination with Krug *et al.* disclosed the apparatus of claim 19, wherein the second information is indicative of density characteristics of the object (the x-ray attenuation measured by the computed tomography device is indicative of density characteristics of the object).

With regard to claim 26, Peschmann in combination with Krug *et al.* disclosed the apparatus of claim 10,wherein the multiple energy prescanner comprises a second computed tomography device (Peschmann, **44**, **46**, **50**).

With regard to claim 14, Peschmann disclosed an apparatus for analyzing an object comprising: an x-ray prescanner (**32**); and a computed tomography device (**44A**, **46A**, **50A**), wherein information (location) indicative of at least one metal artifact (if the object is metallic) is

transmitted from the x-ray prescanner to a processor (**26**) coupled to the computed tomography device.

However, although Peschmann disclosed the advantage of dual-energy scan (column 10, lines 48-68), Peschmann failed to disclose that the prescanner is a multiple energy x-ray device.

Krug *et al.* disclosed a multiple energy x-ray prescanner (**1000**) that transmits information (positional information) indicative of effective atomic number characteristics of the object to a computed tomography device (**1002**).

It would have been obvious to a person of ordinary skill in the art at the time the invention was made to employ a multiple energy x-ray prescanner. As is well known, a multiple energy x-ray prescanner obtains effective atomic number characteristics of an object, which further limits the possible materials being analyzed, thereby increasing the accuracy of material identification.

With regard to claim 27, Peschmann in combination with Krug *et al.* disclosed the apparatus of claim 14, wherein the multiple energy prescanner comprises a second computed tomography device (Peschmann, **44**, **46**, **50**).

Allowable Subject Matter

9. Claims 8, 9, 25, and 28-36 are allowed.

10. The following is a statement of reasons for the indication of allowable subject matter:

With regard to claims 8, 9, and 25, although the prior art discloses a method for analyzing an object comprising the steps of prescanning the object using a multiple energy x-ray device to determine prescan information, transmitting the prescan information to a processor coupled to a

computed tomography device, and performing a computed tomography scan of at least a portion of the object based on the prescan information, wherein the computed tomography scan generates computed tomography scan data and is performed using the computed tomography device, it fails to teach or fairly suggest the step of performing a metal artifact correction on the computed tomography scan data , wherein the prescan information is used to perform the metal artifact correction on the computed tomography scan data as claimed.

With regard to claims 28-36, although the prior art discloses a method for analyzing an object comprising the steps of prescanning the object using a multiple energy x-ray device to determine information indicative of effective atomic number characteristics of the object; and transmitting, to another device that is separate from and coupled to the multiple energy x-ray device, a transmission that is based at least partially on the information, it fails to teach or fairly suggest the step of using the information received at the device to process scan data generated by a computed tomography device as claimed.

Response to Arguments

11. Applicant's arguments filed 03 June 2005 with respect to the drawings have been fully considered and are persuasive. The objection of the drawings has been withdrawn.

12. Applicant's arguments filed 03 June 2005 with respect to claims 1-7, 10-24, 26, 27, and 29 have been fully considered and are persuasive. The rejections of claims 1-7, 10-24, 26, 27, and 29 under 35 U.S.C. 112, first paragraph, have been withdrawn.

13. Applicant's arguments filed 03 June 2005 with respect to claims 1, 10, and 14 have been fully considered but they are not persuasive.

The applicants argue that positional information is not indicative of effective atomic number characteristic of an object. The examiner respectfully disagrees with this argument. As has been indicated in previous office action, because the positional information is determined from effective atomic numbers, it is considered to be indicative of effective atomic number characteristic of the object. To distinguish applicants' invention over the prior art, the claims must be amended to either exclude the positional information from the prescan information, or to define the prescan information by its subsequent usage in processing CT scan data as claimed in claims 8 and 28.

Conclusion

14. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

McClelland *et al.* (U. S. Patent No. 6,707,879 B2) disclosed a remote baggage screening system.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen C. Ho whose telephone number is (571) 272-2491. The examiner can normally be reached on Monday - Friday from 8:00 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward J. Glick can be reached at (571) 272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Allen C. Ho

Allen C. Ho
Primary Examiner
Art Unit 2882

20 August 2005